

ABSTRACT OF THE DISCLOSURE

A microwave plasma processing method, in which a linear plasma is produced by means of a microwave, the surface of an object to be processed is held horizontally with respect to the linear plasma, and the object is processed under the atmospheric pressure or under a pressure near the atmospheric pressure while the object is being moved, a microwave plasma processing apparatus and its plasma head are disclosed. The plasma head has an H-plane slot antenna, and slots are made in the slot antenna at a pitch of $\lambda_g/2$ in zigzag manner on both sides of the centerline of the waveguide. The distance from the slots to the emission end of the plasma head is set to $n \cdot \lambda_g/2$ (λ_g is the wavelength in the tube of the microwave). The plasma head further has an E-plane slot antenna, and slots are made in the slot antenna at a pitch of λ_g along the centerline of the waveguide. A uniforming line having a distance of $n \cdot \lambda_g/2$ from the slots to the emission end of the plasma head is disposed.